

**ABSTRACT**

An electric arc welding apparatus comprising at least a first consumable electrode and a second consumable electrode movable in unison along a welding path between the edges of two adjacent, mutually grounded plates, a first power supply for passing a first welding current at a first low frequency between the first electrode and the two plates, a second power supply for passing a second welding current at a second low frequency between the second electrode and the two plates, where each of the power supplies includes a three phase voltage input operated at line frequency, a rectifier to convert the input voltage to a DC voltage link and a high frequency switching type inverter converting the DC voltage link to a high frequency AC current, an output rectifier circuit to provide a positive voltage terminal and a negative voltage terminal, and an output switching network operated at a given low frequency for directing a pulsating welding current at the given low frequency from the two terminals across one of the electrodes and the plates, and a circuit for independently adjusting the given low frequency so the value of the first low frequency of the first power supply is different from the second low frequency of the second power supply.